ISASC

NTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

NEWSLETTER NUMBER 3. MARCH, 1977

Greetings to Scale Collectors. When I started to collect scales about 17 years ago I felt that I was the only one. I could find no information about scales and no other collectors. Now through the efforts of Bob Stein, who has ferreted out many other collectors, I find myself among a goodly group of collectors. The value of this association should be great. We now have a means of circulating information about scales. The start of whatshould be a collection of valuable information about scales.

When I started my collection I planned to obtain only American made scales. I soon found, however, that few scales were made in this country before 1800. Nearly all scales used before that time had been brought over from Europe with the immigrants or imported later. Many of the fine old scales came from England, France and Germany. I then decided to make my collection general and only exclude scales of large size. I now have scales made in Canada, South America, England, Sweden, Germany, France, Austria, Czechoslovakia, Spain, Italy, Turkey, India, China, Siam, Japan and Australia.

I regret that I do not have illustrations for many of my scales to include in this letter. The generous offer of Michael Crawforth to make drawings suitable for duplication came to my attention too late to employ in this letter. I have had to rely on some of my sketches and rather poor zerox copies of some photographs. I am also taking the liberty of using both sides of the paper. I am making margins wide enough to permit binding on the left side.

In addition to collecting scales I have included weights and literature dealing with scales etc. Some associated things such as measures, toy scales and novelties have also found their way into the collection. The many styles of weights and weighing systems has added much interest to the collecting.

In this letter I plan to give an outline of the history of weighing and of scales. Dates which are reasonably firm will be included. I will also discuss some of the scales which I consider to be rather special and some of the background on them. I do have considerable information about manufacturers of scales but it will not be in this letter. The material following will be the outline of history.

HISTORY OF WEIGHING AND SCALES

Barter and exchange started with early man. Things which could be counted or measured by length or volume presented no problem. Many other things which could not be measured so easily were the problem. This was solved early in history by the invention of the equal-arm balance. Some feel that the balance was the first mechanical invention of man. It has been suggested that the equal-arm scale was developed from the yoke employed to carry two objects at one time. One of the earliest records of weighing is given in the Bible when Abraham weighed out silver to purchase a piece of ground. The type of scale is not mentioned, but it must have been an equal-arm balance.

The use of the equal arm balance continued for many years with no major improvement. At the beginning cords were used as pivots. The method of attaching the cords showed the first improvements. Bell shaped ends of the beam were used to assist in increasing accuracy. Mechanical pivots and bearings followed. The dating of these changes is not too certain.

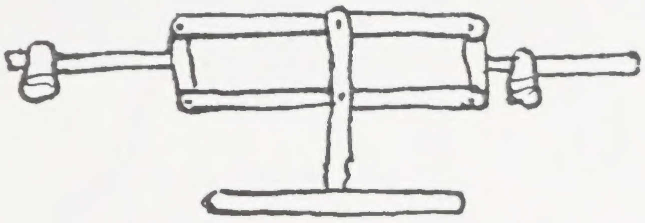
About 400 B.C. the first major change in scales took place. In China and also in Italy the unequal arm balance appeared. This utilized the mechanical advantage of the lever in weighing. The Chinese scale had ivory for the beam and silk cords to attach the weight and load. It was also supported by a cord. The Italian scale was made of metal with metal pivots. It is a question whether the inventions were more or less simultaneous or one was the copy of the other. The substantial difference between the construction would indicate them to be separate inventions.

The unequal arm balance was named "steelyard"many years later. This name is generally applied to the unequal arm balances. The larger beam scales with the curved hook at one end are also referred to as "weighmaster's beams".

Another type of unequal arm balance known as the "bismar" developed near the same time or a bit later. This consists of a beam with heavy knob at one end and a hook at the other. The beam is supported by a loop of cord. The beam is moved along in the loop until a balance is achieved. Calibrations on the beam indicate the weight. The bismar was found along the Mediterranean and alsoin the Scandinavian area. They are also known as the "besman" in Sweden. The bismar is the only type of scale with a movable pivot.

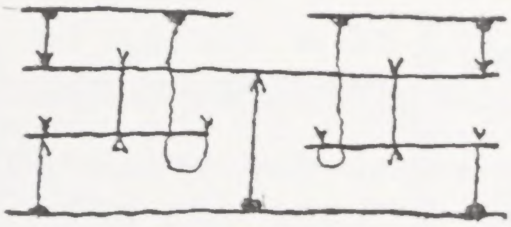
The major value of the unequal arm scales is the ability of a small weight to weigh a heavy object. The equal arm scales required weights as heavy as the item being weighed. The equal arm and the unequal arm scales remained the only types in use for nearly two thousand more years.

In the year 1669 a man named Roberval invented a device which has been referred to as an "Enigma" (something that baffles). This consisted of a parallelogram of levers extended from the ends which could support equal weights at various distances from the ends and remain in balance. This was the mechanism required to make an equal arm balance with the pans above the beam. This principle was not used for the construction of scales for over 100 years. The Roberval type scale became common in the early 1800s. It still remains an important design feature in the manufacture of scales.



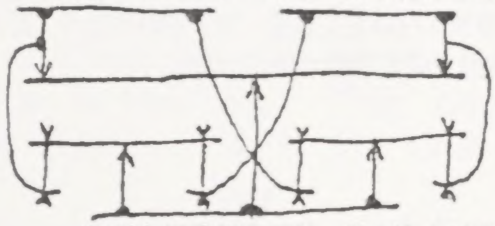
ROBERVAL'S ENIGMA

About 1850 a Frenchman named Beranger invented a method of supporting the pans above the beam utilizing a system of levers in which all bearings can be knife edges. The sketch to the left shows the arrangement of levers. There are three main beams and thirteen bearings. This type of scale is common in Europe, but is not found to any extent in America. I have been told that it is not legal in this country. I have not seen it in print that it is not legal. Handbook No. 44* does not rule it out since it will meet all of the requirements.



BERANGER SCALE

Another mechanism which accomplishes the same purposes as the Beranger balance is the Phanzeder balance. This one was slightly later. These scales are very interesting to watch in action as there is so much movement.



PHANZEDER BALANCE

A big step in scale developement came in America when Thaddeus Fairbanks of St. Johnsbury, Vermont "invented" the platform scale to weigh wagons. (It must be noted that a man named Wyatt in England invented a platform scale in 1754 to weigh vehicles on the turnpikes. Several were made and used, but there was no effort topromote the use of the scale. Wyatt utilized the type of levers which Fairbanks used nearly one hundred years later.) In 1830 Fairbanks developed the "A" levers which transferred the load to a steelyard. The entire arrangement was placed in a pit and wagons could easily drive on. Fairbanks made an effort to sell his scales. Within ten years his products were listed in the catalogs of wholesale merchants. Ten styles were in the Carr Catalog of 1838. I have much data on Fairbanks and I hope to have a data sheet available to ISASC members. This may constitute part of my next newsletter.

*U.S. National Bureau of Standards. Available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 Price $7.90 Ask for Stock Number 003-003-00894-0.

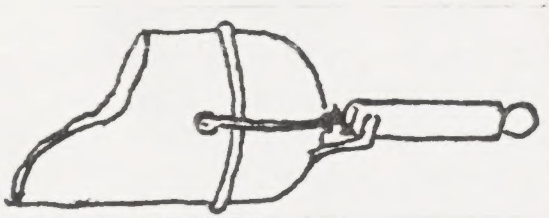
The 1800s were a busy time for mechanical scales. In addition to the developement and promotion of the platform scale, the spring balance and the pendulum scale were made. About 1840 England started sending mail by weight, and in 1863 the United States went to weight for mail. A large group of postal scales came into being.

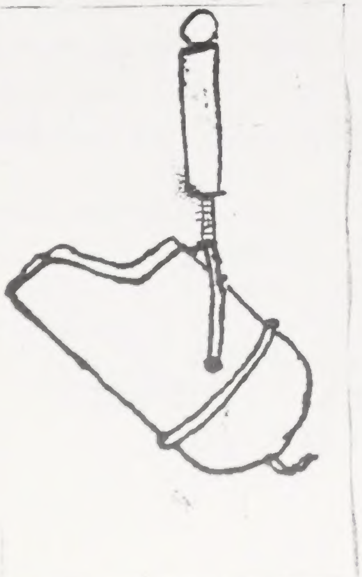
The spring balance and the pendulum scales were direct indicating scales. No weights were required and the weight could be read from calibrations. Michael Crawforth has given us a Data Sheet in the last letter which covers the pendulum balance. It is interesting to note that Leonardo Da Vinci between 1454 and 1519 devised the pendulum balance. He made sketches in his notebooks of such a scale but there is no evidence that any were ever built. It was not until the 1800s that the pendulum balance or "bent-lever" scale was generally used.

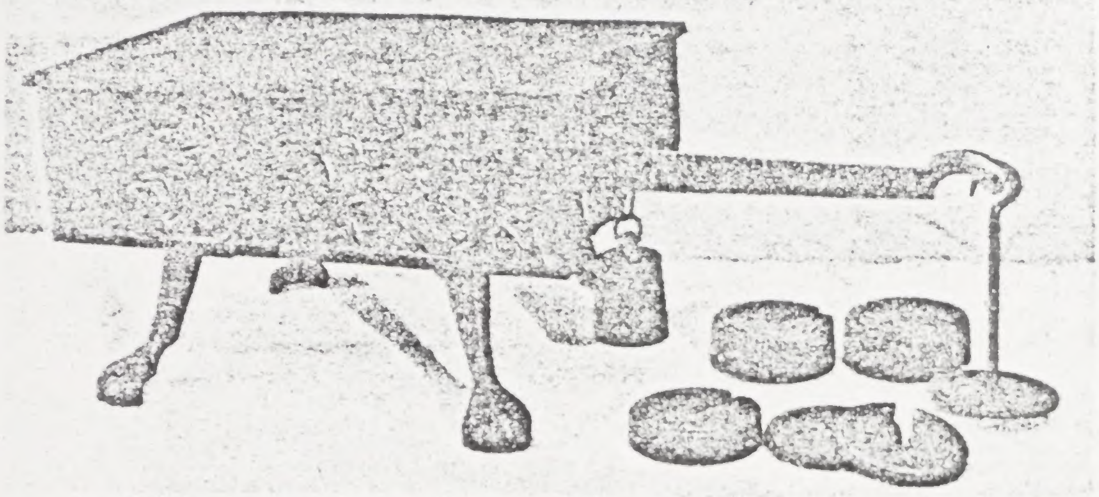
The spring scale employs the distortion of a spring to indicate the weight of the object attached. The spring may be used in tension, compression or in torsion. Many of the cheaper spring scales found today are marked "not legal for trade". This is not necessarily an indication that springs are not reliable, but that many are poorly made, and consequently do not have great accuracy. A good spring is a reliable means of measuring weight provided that is high quality steel and is mounted in a manner to prevent overloading. The distortion of a piece of steel is used today as the measuring element in the most modern electronic load cell weighing machine.

UNUSUAL SCALES IN MY COLLECTION

Several scales in my collection I consider to be unusual or rare. The first one is interesting. I call it a "scoop scale". This is my most recent acquisition. (See sketches) When it is in the scoop position it looks like the usual grain or sugar scoop. The scoop is sheet iron with a brass dome. The handle is iron with brass caps. The overall length is one foot and the scoop is four inches in diameter. When it weighs the contents, the scoop is released from a clip from the handle. The scoop than tilts and the handle is held vertical. In this position a square rod within the handle pulls out restrained by a spring. Calibrations of two pounds by ounces will then indicate the weight of the material in the scoop. There is no makers name on the scale. The design of the weighing element is quite similar to the early designs of Richard Salter.

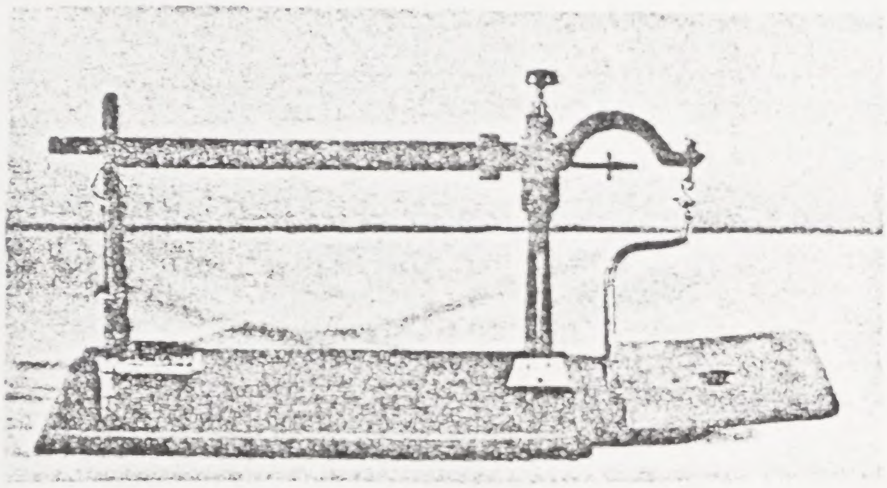




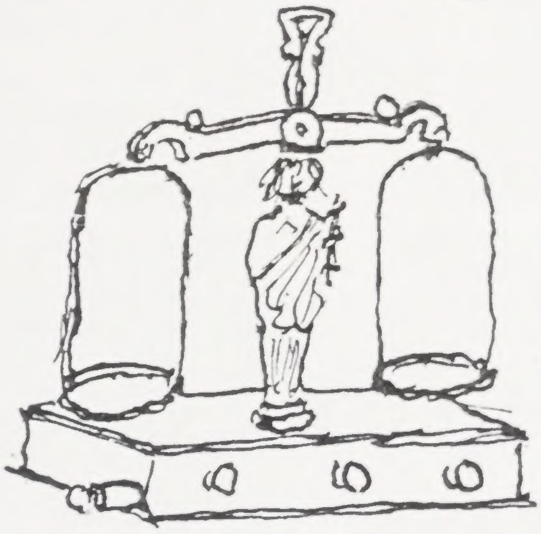


On the left is a platform scale by Fairbanks. This is one of the earliest counter scales, about 1835. The same mechanism is used as the larger platform scales. The platform is 16" x 8". It is about 8" high. The beam extends about 8". It will weigh 100 pounds by half ounces. Fairbanks was a stove builder prior to making scales. The cast iron construction of this scale shows the general construction of stoves.

This scale is a "Manufacturers Estimaters Scales". Made by H. Troemner of Philadelphia. An item weighed on this scale will be indicated as pounds per gross or pounds per hundred. It will actually weigh up to one pound. It is beautifully made and quite sensitive. The base is 12" x 4". I purchased it from a Music museum. The owner of the museum told me when the sale was completed that the only place to get an old scale would be at a music museum (a pun).

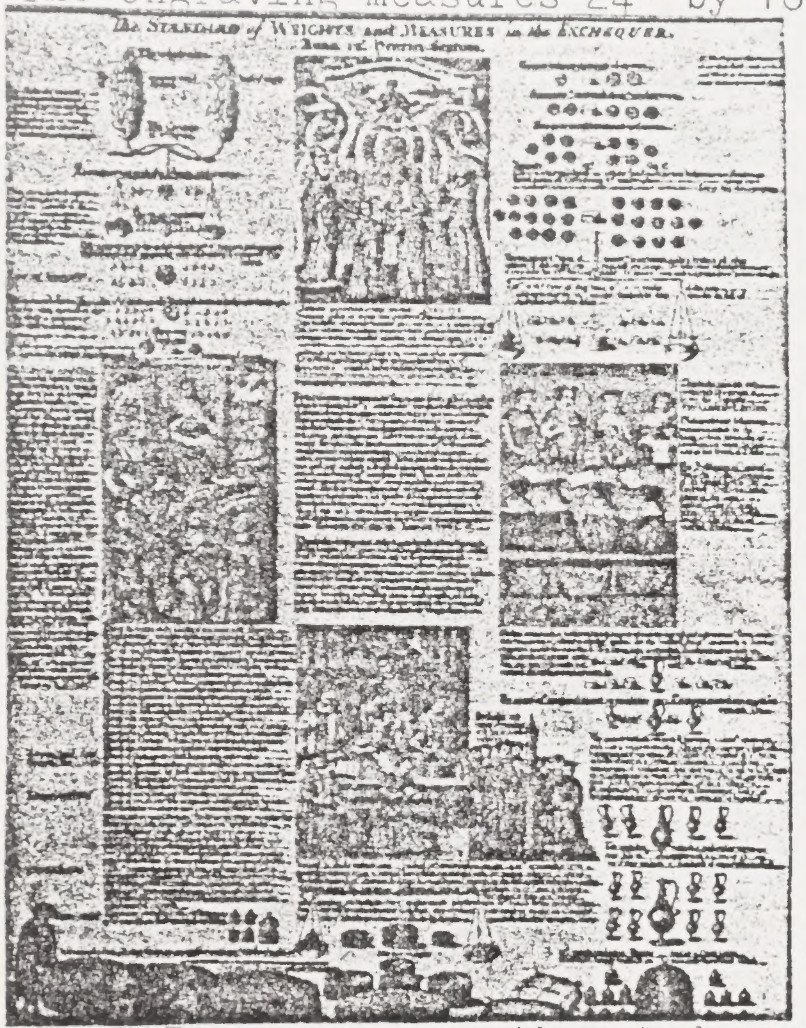


The scale sketched below is about full size. Actually it is a novelty. The base is marked 29 Janner 1886. The knob at the lower left is the head of a small pencil. When it is removed the bottom swings open revealing a small book printed in gilt ink. It is a dance program for "Dance and Get-together of The Vienna Pharmaceutical Soceity, January 29th, 1886. It then lists the dances by title of tune and composer. One dance is entitled "The Sounds of Aesculapius" He was the God of Medicin, and the column of the scale is a statue of the god holding a staff with a snake entwined. Recently a friend gave me a clipping from "Antique Phonograph Monthly" which shows a similar dance book with a model phonograph on it. The article states that novelties of this type were made by the firm of Augustus Klein of Vienna from 1875 for several years. This is of course not a working scale, but it is an interesting addition to a collection.



Another addition to the collection is an original copy of an engraving made in 1746. It is a copy of the standards for

Weights and Measures established by King Henry VII of England. my copy is in excellant condition. This document is discussed in the book "Money Scales and Weights" by Sheppard and Mushman. The publisher is mentioned by Michael Crawforth in Letter No. 2. The engraving measures 24" by 18". A small reproduction is shown here. It is written in old English script and is not easy to read. I have been trying to find a method of having copies of it made. Just this week I did find a printer with a large enough camera to make a nearly full size copy. If it works out well enough I will offer copies to ISASC members at cost. I hope that possibly Michael may be able to supply us with a translation into modern English.


The STANDARD of WEIGHTS and MEASURES in the EXCHEQUER.

About a year ago I received an appointment which takes much of my time. The Early American Industries Association, Inc., of which I have been a member for over ten years, appointed me Chairman of the Meetings and Program Committee.This requires me to select suitable meeting places and arrange for several days programs twice a year. The EAIA encourages the study and better understanding of early industries in the home, in the shop, on the farm, and on the sea. Also to discover, classify, preserve and exhibit the tools and implements which were used. Scales fall within this category. I note that Richard Jenkins, a member of ISASC is also a member of EAIA.

It has been fun preparing this newsletter. I am sorry I did not have better illustrations and that I did not have time to write many interesting stories about other scales in the collection. I hope that my next newsletter will be much better than this one. In the meanwhile I would be happy to receive letters from other members and even more happy to have them visit the Scale Loft. I have not been purchasing duplicate scales and do not have any to offer in trade at this time. I look forward to receiving the newsletters in the future and possibly some visits.

Fraternally,

Al Eaches

Albert R. Eaches